

In the Claims

1. (Currently amended) A fastener driving tool comprising:

a tool nose through which a fastener is fired;

a loading apparatus for introducing said fastener into said tool nose, said fastener being propellable by a gas combustion mechanism, wherein said gas combustion mechanism comprises:

a first priming cylinder having a first piston;

an air intake; and

a first valve apparatus for fluidally connecting said air intake to a second delivery cylinder having a combustion space, a second piston and an exhaust valve, said first priming cylinder fluidally connected to a fuel gas reservoir via a second valve apparatus,

wherein said first priming cylinder receives fuel gas from said fuel gas reservoir and air through said air intake to form an air/fuel gas mixture therein,

wherein said first piston compresses said air/fuel gas mixture and transfers said air/fuel gas mixture to said combustion space of said second delivery cylinder via said first valve apparatus,

wherein during the initial transfer of air/fuel gas mixture to said second delivery cylinder said exhaust valve is opened thereby allowing said air/fuel gas mixture to purge any residual exhaust gases out of said combustion space via said exhaust valve, and after said exhaust valve closes and said air/fuel

gas mixture transfer is complete.

and wherein said air/fuel gas mixture is ignited therein and urges said second piston towards said fastener and propels said fastener away from said tool nose.

2. (Previously presented) The fastener driving tool as claimed in claim 1, wherein said first piston is mechanically actuated.

3. (Previously presented) The fastener driving tool as claimed in claim 1, wherein said second valve apparatus is opened and closed via mechanical actuation.

4. (Previously presented) The fastener driving tool as claimed in claim 1, wherein said first piston is electromagnetically actuated.

5. (Previously presented) The fastener driving tool as claimed in claim 1, wherein said second valve apparatus is opened and closed via electro-magnetic actuation.

6. (Previously presented) The fastener driving tool as claimed in claim 1, wherein said fastener driving tool is a nail gun.

7. (Previously presented) The fastener driving tool as claimed in claim 1, wherein a mechanism movable between a first and a second position along said tool nose includes a latching apparatus for engaging said second position, such that said air/fuel gas mixture is further compressed by said second piston as said mechanism is moved from said first to said second position with said latching apparatus engaged and wherein the downward force from the ignition of said air/fuel mixture overcomes said latching apparatus and urges said second piston towards said fastener.

8. (Previously presented) The fastener driving tool as claimed in claim 1, wherein

a bumper is disposed near the bottom of said second delivery cylinder, said bumper being compressible by said second piston in the bottom of the travel of said second piston and wherein the subsequent restoration of said bumper forcibly returns said second piston back up said second delivery cylinder.

9. (Previously presented) The fastener driving tool as claimed in claim 8, wherein the interior of said bumper forms a chamber for porting pressurised air via an outlet valve through a transfer channel to said first priming cylinder as said bumper is compressed.

10. (Previously presented) The fastener driving tool as claimed in claim 9, wherein said first piston has an internal receiver for storing said pressurised air.

11. (Previously presented) The fastener driving tool as claimed in claim 1, further comprising a sealing ring having a semi-flexible lip and being disposed around the periphery of said second piston.

12. (Previously presented) The fastener driving tool as claimed in claim 1, wherein a mixing fan is rotatably mounted to the interior of said second delivery cylinder.

13. (Previously presented) The fastener driving tool as claimed in claim 12, wherein an externally mounted motor drives said mixing fan via magnetic coupling.

14. (Previously presented) The fastener driving tool as claimed in claim 1, further comprising a plate valve and an exhaust plenum, wherein said plate valve fluidly connects said second delivery cylinder with said exhaust plenum when said plate valve is opened for exhausting said second delivery cylinder.

15. (Currently amended) An apparatus utilising a gas combustion mechanism for propulsion of an object, said gas combustion mechanism comprising a first priming

cylinder having a first piston and an air intake fluidally connected via a first valve apparatus to a second delivery cylinder having a combustion space, a second piston and an exhaust valve, said first priming cylinder fluidally connected to a fuel gas reservoir via a second valve apparatus, wherein said first priming cylinder receives fuel gas from said fuel gas reservoir and air through said air intake to form an air/fuel gas mixture therein, wherein said first piston compresses said air/fuel gas mixture and transfers said air/fuel gas mixture to said second delivery cylinder via said first valve apparatus, wherein during the initial transfer of air/fuel gas mixture to said second delivery cylinder said exhaust valve is opened thereby allowing said air/fuel gas mixture to purge any residual exhaust gases out of said combustion space via said exhaust valve, and after said exhaust valve closes and said air/fuel gas mixture transfer is complete, and wherein said air/fuel gas mixture is ignited therein and urges said second piston towards said object to propel said object.